approach

JULY 1979 THE NAVAL AVIATION SAFETY REVIEW

HAVE YOU GOT THE GUTS?

THIS question may seem to be the antithesis of safety. Usually, when it's asked, it's because someone wants you to do something that is basically stupid. They appeal to your sense of pride; your desire to be courageous. Here, we are asking just the opposite. Have you got the guts to make SAFETY your first priority? Have you got the guts to ignore your pride, the pressure of your superiors and peers, and your desire to appear courageous?

Think about it a little while before you answer, lest you fool yourself. It takes no guts to note an obvious discrepancy, pull out a NATOPS Manual, and show the CO, in black and white, why you won't take the flight! Guts are not what is required to take a down aircraft on that "high visibility" mission; that's stupidity. What takes a lot of guts is to have a situation where everything is technically "legal," but to make the decision not to perform the task because, in your own judgment, the situation is not safe.

Right about now, all of the "operational readiness" gents are getting their pencils out to write a nasty letter to the editor. They'll begin something like, "How dare you tell your readers that they have the right to simply decide not to take a mission . . ." Well, here's how.

Remember the little sentence in your NATOPS Manual, somewhere in the beginning of the Emergency Procedures section, that reads something like this: "These procedures are not intended as a substitute for sound judgment . . ." This sentence was not included to allow you to ignore safe procedures, but to give you, in black and white, the option to use your own judgment. This includes being extra cautious if you deem it appropriate. If you don't believe this, try reading paragraph 101 of OPNAV 3710.7J.

The bottom line is that it takes a lot of guts to decide to follow your own judgment. It takes a lot more guts to stand firm in your own convictions than to simply do only what's expected of you. You have the knowledge, the training, and the ability to make SAFETY your first priority. Have YOU got the guts?

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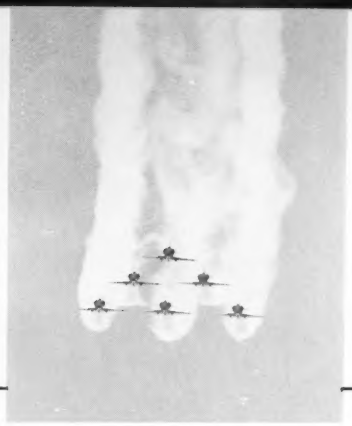


This month's cover is a photograph of the U.S. Navy Blue Angels in a wedge formation.

Copiloting an instrument departure

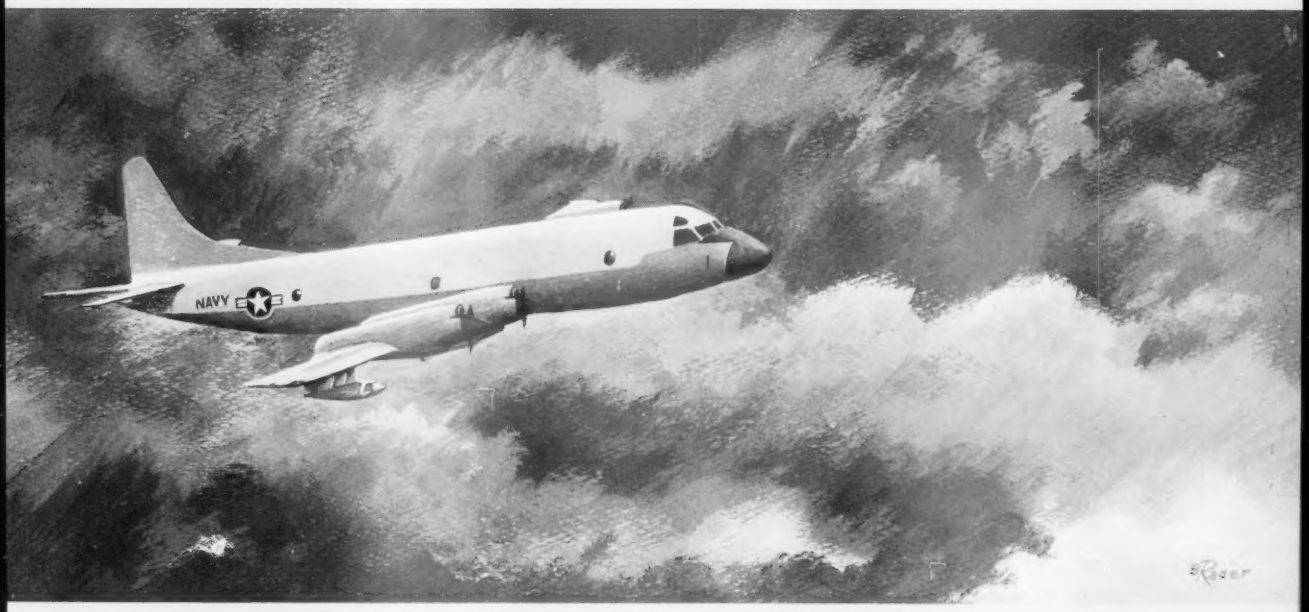
By LCDR W. D. McClellan
and
LT L. R. Krahe
VP-48

ONE of the most often ignored areas of responsibility in multipiloted aircraft operation is the duties of the copilot during an instrument departure. Granted, the old adrenalin flows and everyone is at his peak during a WOXOF departure, but how many of those have you done lately, or ever? The usual case is a day/night IFR departure with a low ceiling – possibly 100-600 feet – overcast.

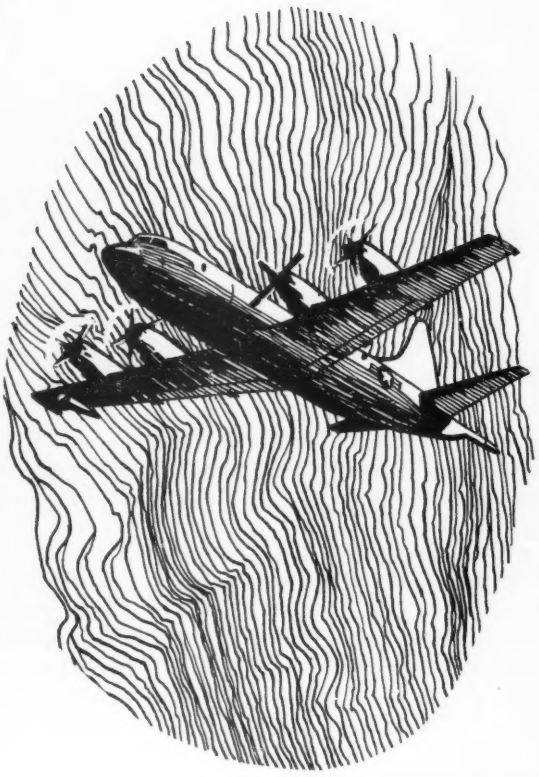
To accomplish an ITO, let's look at some of the basic requirements. The NATOPS Instrument Flight Manual describes an ITO:

- "The ITO procedures and techniques are an invaluable aid during takeoffs at night, toward and over water or deserted areas, and during periods of reduced visibility. These takeoffs are accomplished by combined use of outside visual references and flight instruments."
- " . . . As the takeoff progresses, the pilot's scan should transition from outside references to heading, airspeed, angle-of-attack, and attitude monitor . . . It is essential that the pilot establish his instrument scan prior to losing all visual reference."
- " . . . Check the vertical speed indicator and altimeter for positive climb indications and comply with applicable NFM for specific aircraft before retracting gear and flaps."

So there, an ITO is a relatively simple maneuver; use visual references and then transition to instruments as you go. There are, however, a few pitfalls in this technique. Example: One night a Boeing 707 took off from an island carrying 69 passengers and a crew of 10. Approximately 1 minute later, the aircraft settled into the water 11,000 feet



Copilot reads the takeoff checklist and provides an instrument backup while the pilot flies the aircraft.



from the departure end of the runway, in a left descending turn. The aircraft broke up immediately upon impact and sank in 2300 feet of water, with only one passenger surviving. Due to its inaccessibility, the wreckage was never located, and neither the flight data recorder (FDR) nor the cockpit voice recorder (CVR) were ever recovered. Because of this, the subsequent accident investigation conducted by the government was based primarily upon speculation.

The board ruled out lost engines and flight control malfunctions and was left with but one inescapable conclusion – as far as they could determine, a perfectly airworthy 707 had been inadvertently flown into the water by a highly trained and experienced flightcrew.

In August 1976, APPROACH printed an Anymouse article written by a P-3 copilot who reported a similar incident, which fortunately had a less tragic outcome. He was the pilot at the controls of an aircraft which had just departed an island NAS and was over water in a left climbing turn, in compliance with the SID. The relative quiet of the clear but moonless night was suddenly shattered by the RAWS warning, which activates at 170 feet AGL. Upon investigating, the pilots discovered the aircraft to be descending through 140 feet AGL at a rapid rate of descent. An immediate recovery was initiated and the descent was arrested somewhat below 100 feet. Had the flaps been down (disabling the RAWS), had the pilots been a little slower in the recovery, had the . . .

From the preceding examples, it is painfully evident that multipiloted aircraft, in seemingly good operating condition, can and do crash during night or instrument departures. Why? What were three sets of eyes and three brains doing at the time? Were they distracted by some "deferred emergency"? (One of insufficient gravity to warrant an emergency procedure or radio call.) Possibly. Did the copilot fail to perform his primary function, that of safety pilot? Most definitely. Again, why?

In the April 1974 issue of APPROACH, an article titled "The Last Run of Flight Nine One Five" appeared.

Photographs by PH2 Jeff Ignatovich

Providing SID or departure navigation backup is just one of the copilot's duties.

Although this article dealt with the night VFR approach and landing environment, the points made in this article may be applicable to our discussion. Drs. Conrad Kraft and Charles Ellsworth found that 11 of 12 experienced airline pilots were unable to successfully land a simulator using visual cues alone. Dr. Kraft concluded these pilots were being asked to solve a problem that exceeded normal human visual ability. When the approach angle is relatively flat, there is little or no change in the visual angle. (The human brain normally cannot detect any change when the rate of change is less than 1 minute of visual angle per second.)

This physiological deficiency may well be a contributing factor in ITO mishaps. It may be the determining factor as to why two of Dr. Kraft's night visual approach factors are particularly dangerous in the ITO/departure environment. These two factors are:

- "An approach over dark land or water where lights are to the side of and below the aircraft . . ." (Consider a long, straight-out departure over water on a dark, moonless night – no horizon, only stars.)
- "Airport situated at lower elevation and on a different slope from surrounding terrain." (Peripheral visual cues may be misleading.)

If the transition to instruments is not positive and effective, these two factors may contribute to a perfectly sound aircraft being involved in a tragic mishap.

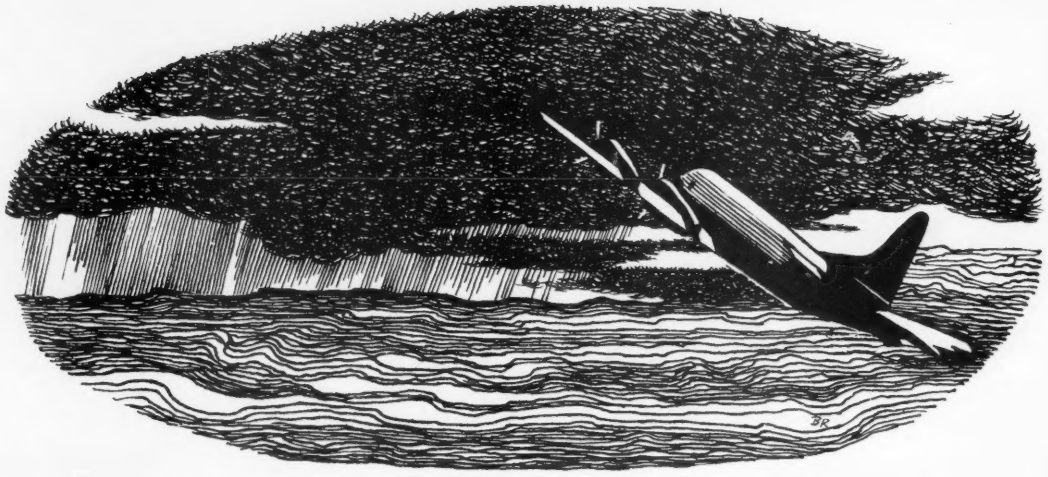
Further complicating the transition to a safe instrument scan is the use of SIDs (standard instrument departures). Some of these procedures are quite complicated, depending upon the radio facility/transition navigation fix used. In complying with turn requirements, and/or minimum altitudes, the copilot is often required to tune and identify radios or fixes at low altitudes. This also involves changing the radio input to the aircraft course/heading indicator system, again detracting from the instrument scan.

If, in itself, this is not enough of a problem, some aircraft have positioned the radio control boxes out of the effective reach of the copilot. Compounding the problem, how about the physical location of the SID plate itself? Do you have to put your departure plate on a knee board? Clip it to the glare shield? What about lighting for it? Can the pilot and/or the copilot effectively view the SID plate without breaking his instrument scan? Probably not! Any or all of these factors may induce what is technically known as spatial disorientation (vertigo). Recognize that it can happen to the safety pilot also and we'll discuss it a little further on.

So, while the pilot is struggling to establish his instrument scan, fly the departure, maintain minimum airspeeds, required altitudes, and headings, what is the copilot doing? He's acting as safety pilot, tuning radios, talking to Departure, and asking the navigator for estimates – all while "squawking ident." But what are his priorities, either as defined or implied? Well, I guess we can look them up, right? Wrong! Instrument Flight Manual? – nothing! P-3 NATOPS Flight Manual? – nothing! General NATOPS – nothing! What is a copilot to do?

In most cases, the duties and responsibilities of the copilot are either nonexistent or ill defined. The exception is found in the P-3 NATOPS under copilots' duties during the approach phase. *(There are some fairly specific duties for the copilot listed in Section IX of the P-3A/B/C NATOPS Manual. They do not, however, address instrument departures specifically. They do leave quite a bit of room for specific wing/squadron/crew guidelines. – Ed.)*

Before offering some suggestions for "defined or specific duties" during an ITO, we should look briefly at the biggest implied duty of all – safety pilot. That fellow over there in the right seat is, as has always been inferred, the safety pilot. The following quote, found in the back of a dusty filing cabinet, was first published a few years ago as COMFAIRWINGSPAC NOTE 5100 (name changed to COMPATWINGSPAC):



Modern multiengine patrol aircraft are designed and built to be operated through team effort, rather than by a single individual. The copilot's function is specifically patterned as a safety backup for the pilot throughout the entire flight spectrum from engine start to shutdown. Traditionally, the copilot has been assigned additional tasks as a means of alleviating the administrative load on pilots during takeoff/landing, airways, and tactical evolutions. However, the crew copilot is, first and foremost, a safety pilot, and as such is directly responsible for the maintenance of a consistently alert backup for the pilot at all times. Squadron commanding officers should ensure that their patrol plane commanders establish, within their individual crews, specific cockpit procedures applicable to particular operational or training missions, and should require strict adherence by their copilots to such duties during all phases of flight, from chock to chock.

The aviator who occupies the right seat in a patrol aircraft, regardless of rank or billet, is to be considered the crew safety pilot as long as he maintains that position in the cockpit. In this capacity, he will, without deference to rank or title of the pilot occupying the left seat, offer constructively critical recommendations as necessary throughout the mission, in order to maintain the safest possible flight environment. It is absolutely essential to the preservation of aircraft and crew resources that safety pilots thoroughly understand and accept their responsibilities in this area.

That more or less sums up how most plane commanders and copilots *perceive* the copilot's responsibilities. But, as we have seen, copilots *have* failed to be the safety pilot. Physiological deficiencies, material deficiencies, and individual ability all become unimportant if the plane commander's attitude and treatment of his copilot do not match the copilot's perception of his duties. Even if the copilot can overcome all the previously described pitfalls, if his plane commander does not give him the expressed and implied authority to act, he will contribute to the possibility of an ITO mishap.

What, then, are the pilot's responsibilities in ensuring his copilot fulfills his own responsibilities? Here's a list of do's and don'ts, some of which are adapted from "Copilot or Right Seat Puppet?" (APPROACH – DEC '74).

Do thoroughly brief your copilot on all expected maneuvers (SID, Radvecs, etc.) and the limitations you expect to fly – (altitude, airspeed, angle-of-bank, AOA, rate of climb, etc.).

Don't take over the copilot's duties in the interest of saving time (impatience).

Don't believe a really proficient aircraft commander can perform all cockpit functions better.

Do debrief your copilot on his performance, both good and bad, but not during the flight.

Don't direct your copilot to perform an unauthorized maneuver or procedure, or make a false radio report to a controlling authority to cover up an unauthorized maneuver you are conducting.

Do know the capabilities and limitations (both physical and mental) of your copilot. He may have a problem, or a

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Copilot, LTJG Mike Raab, switches attitude sources to verify accurate attitude information for instruments.

hangup about flying around at 200 feet over the water.

Do continually reinforce the idea that a professional, alert copilot may be the only difference between successful and unsuccessful mission completion.

6

Do remember that when you are in the right seat, you are the copilot, and conduct yourself accordingly.

In suggesting specific duties for the copilot during an ITO, let us now consider spatial disorientation. The possibility that the pilot will get vertigo during an ITO is extremely high. Remember, in our definition of an ITO, we said, "combined use of outside visual reference and flight instruments." Then we raised the possibility that, under certain combinations of conditions, the human brain cannot detect small changes in the *visual* flightpath. Add up all these factors and throw in the normal inner ear versus instrument scan problem and one can almost guarantee some degree of pilot vertigo on each and every ITO. The same factors most certainly will affect the copilot, but he must be particularly aware of them and continually fight off their presence so as to be ready to assume control of the aircraft at any moment. To accomplish this, each copilot should have a game plan; an idea of what he would do if the pilot suddenly says, "I've got vertigo. You take the aircraft." Some plays for your game plan might include:

- Lower seat as far as possible to facilitate instrument scan.
- Be so familiar with departure procedure that you anticipate the pilot's next move and expect to see the instruments react accordingly.
- Turn up lights as bright as possible to reduce peripheral cues.
- Consciously check and verbally note applicable heading, altitude, and airspeed limitations at significant waypoints of the takeoff/climb/departure procedure. For example: When pilot calls for gear up, check positive rate of climb *and* altitude ("200 feet, climbing at 700 FPM"). When he calls for flaps, check altitude and airspeed ("400 feet, 140 knots"). Approaching radial/heading intercept, note present heading, new heading, anticipated direction of turn, altimeter, and airspeed ("Approaching 070 radial, right turn to 070, passing 200 feet for 700, airspeed 230").
- Check primary flight instruments immediately before and after diverting your attention to change radio/NAVAID frequencies or squawks.
- Jot down, in a convenient place, the emergency safe altitudes and sector safe altitudes from the approach plate.
- Don't ever assume the pilot will take corrective action to recover the aircraft from an *extremis* situation. If he doesn't respond to firm suggestions, take the aircraft.
- In the event of an emergency, be prepared to not only "assist as directed/required," but primarily act as the safety pilot. Don't let your attention be distracted.

Perhaps, now armed with the foregoing knowledge of the physiological material, environmental, and psychological aspects of the instrument departure, we can better prepare ourselves for flight in this regime. It is hoped that applicable portions of this dissertation will stimulate readyroom discussion on the topic of copilot duties and responsibilities, and that they will find roots in squadron SOP, Stan-Notes, training syllabi, and, ultimately, multiengine/multipilot NATOPS manuals. ◄

BRAVO ZULU

LTJG Jim Duffy
LTJG "JJ" Quinn

THE flight was scheduled as a routine night CAP/ACI mission from the USS FORRESTAL. The crew of the F-4J, LTJG Jim Duffy, pilot, and the RIO, LTJG "JJ" Quinn, performed their preflight and man-up in normal fashion with no discrepancies noted.

Once in tension on the cat, military run-up and afterburner selection normal, the aircrew gave the "lights-on" salute. As the cat fired, the pilot felt the starboard throttle travel back with an uncontrollable force, causing the afterburner on that engine to blow out midway down the stroke. This backward force caused him to release forward pressure on the port throttle. Consequently, once airborne (barely), the port burner also blew out. The results were readily apparent. The aircraft began settling below flight deck level. Prompt and proper coordination, plus instant communication between this alert aircrew, confirmed that the F-4 was still flying and that ejection was not necessary.

LTJG Duffy was able to relight the port burner, but noticed that the starboard engine was stuck at 89 percent and 4200 PPH fuel flow. Notifying the FORRESTAL of their difficulty, the decision was made to recover aboard. After an aircraft controllability check at 5000 feet, the aircrew decided to use a full-flap vice half-flap approach, in order to keep the two engines closely matched in RPM. All NATOPS procedures were carried out and LTJG Duffy executed a perfect Case III approach to an arrested landing aboard ship. The aircraft's starboard engine had to be secured using the Engine Master Switch, as a result of the Power Lever Control Lockout Piston Cap which was discovered missing from the Power Lever Control Assembly.

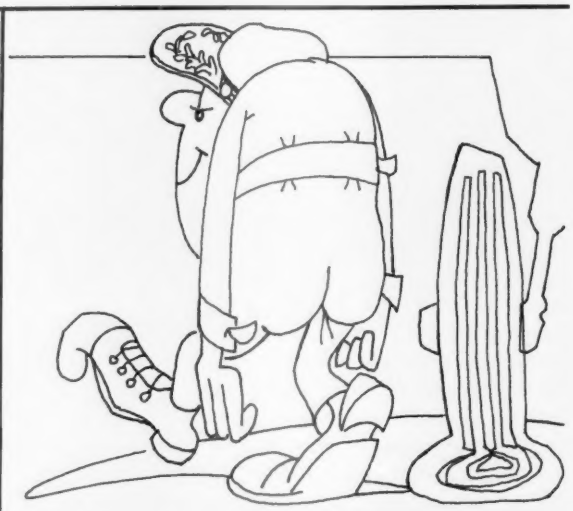
By their superior performance in airmanship, LTJGs Duffy and Quinn saved a valuable F-4J from imminent destruction. Throughout the entire evolution, the flightcrew of this *Phantom* performed their emergency procedures in a precise manner, demonstrating the professionalism expected of seasoned carrier-based aviators. Well done to this aircrew, who reacted in a prompt, professional manner.

Left to right: LTJG J. J. Quinn, LTJG Jim Duffy

KEYSTONE KOPS AND LEADFOOT!

SAFETY, although a serious business and not to be taken lightly, does have its lighter side at times. It's not too difficult visualizing the plights of the individuals in the two tales of the inattentive that follow.

• During a routine engine inspection, a P-3 maintenanceman was in the process of repositioning a ladder when a second maintenanceman requested the use of the same ladder. As the *first* man turned to answer the *second,* the 8-foot ladder which he was carrying swung around and struck another ladder on which a *third* maintenanceman was working, causing him to fall to the deck below! *(Charlie Chaplin couldn't have done it better! – Ed.)*



• While on landing rollout, the pilots of the *Orion* noticed an unusual amount of airframe vibration as the aircraft was brought to a stop. The flaps were raised, at which time the aft observer reported that the two port tires were flat. The deflated pilots and plane were removed from the runway and the tires changed, followed by an uneventful return to the line.

Postflight inspection revealed that the thermal fuses had activated, thereby deflating the tires. No flat spots on the tires, nor skid marks on the relatively dry runway were found. Excessive braking was indicated.

There was a crosswind on landing and the rather large pilot (240 pounds, with a size 14 boot!) had inadvertently exerted pressure on the port brake to compensate for the crosswind, causing the fuses to do their thing! It is to be noted that this friendly, incredible hulk is affectionately called Leadfoot! *(We wonder if he's any relation to Bigfoot! – Ed.)*

Although neither incident resulted in any serious injury or damage, the fact is that any momentary lapse in awareness can lead to mishaps of a more serious nature. Maintain a constant, professional approach in whatever you do, and maybe the inevitable mishap waiting to happen – won't. It doesn't have to!

Never happen to me!

HOW many times have you read in an aviation publication about someone making an unintentional gear-up landing and said to yourself, "It could never happen to me." Usually such articles point out, as a primary cause, a break in the "normal" habit pattern.

The following near-miss recently happened in an A-7E to a fleet-experienced pilot with over 1700 total flight-hours.

Completing an ACL approach, the pilot elected to execute a practice precautionary approach. The gear were raised and the trailing edge flaps were "beeped" to one-half to increase the climb rate to the required 180-degree high position. At the 180, the pilot quickly raised and lowered the flap handle rather than "beeping" the trailing edge flaps full down. This dual motion by the left hand apparently satisfied the physical habit of lowering the gear and flaps. Moments later, the pilot, *knowing* that the gear were down, checked the indicators and noted (but did not register) three UPs, checked the trailing edge flaps full down, and leading edge flap indicator reading down. This apparently satisfied his visual check on the gear. He then began concentrating on making a good approach and was startled by frantic calls from the tower as he rolled out in the groove. Fortunately, the calls were early enough and a successful waveoff was executed.

The following points are noteworthy:

1. This pilot – maybe like you – thought **it could never happen to him.**

2. The proximity and similar shape of the leading edge flap indicator to the landing gear indicators in the A-7E can cause confusion.

3. The normal habit pattern was broken due to the different type of approach, and entering the landing pattern from an abnormal configuration (gear up, flaps one-half).

A hearty well done is in order for the tower crew for preventing a costly accident and probable injury.

It is certain that this pilot's attitude of "It could never happen to me" has changed! Let's hope it never happens to **you.** ◄

SIMPLE OR STUPID

By LCDR George T. Coker
VA-196

LIKE you, I have read many accident reports and have tried to gain a little insight from them. However, I periodically read one that really strikes me and I never forget it. I can think of about a dozen such accidents, and they were really tragic. What made them particularly tragic is that they seemed so dumb. Now, why does a good aviator do something stupid and kill himself?

Invariably, the aviator concerned was a good flyer with adequate experience. He was noted for his judgment, flying skill, lead capability, etc. He was well liked and respected. So, why did he do something dumb which cost him his life? Obviously I am not talking about a weak aviator, nor marginal performer, and certainly not about a stupid aviator. So I ask the question again: Why does a good aviator do something stupid? Let's consider the big picture of safety, and perhaps we will find an answer.

Let's view a chalkboard as the area of operational flying. Now draw a vertical line (Fig. 1).

This line I will call the *line of safety*. The meaning of this line is very definite. To the right of this line is the area where an aircraft can fly without harm. To the left of this line, flying is plain dangerous. If you penetrate this line to the left you will almost certainly do damage to your aircraft or property, and likely kill yourself.

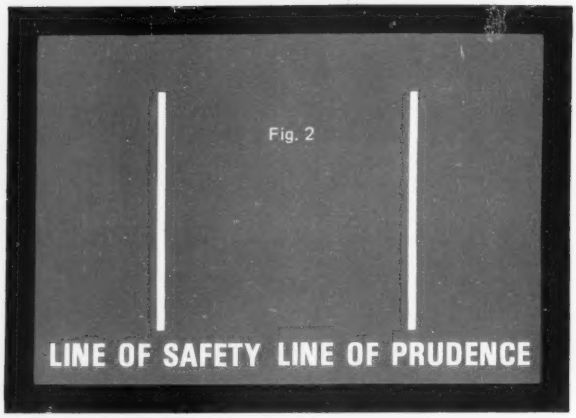
For example, if you frequently fly (unauthorized) below 200 feet, it is only a matter of time before you fly into the ground. If you persist in doing ACM or aerobatics in IFR conditions, you will soon become disoriented and stall and spin. If you forget air temperature and field elevation during heavy gross weight takeoffs, you may not make it.

The major problem in understanding the *line of safety* is that it frequently appears hazy. Perhaps this line should be wavy instead of straight. Also, the line is extremely thin. One second you may be safely to the right of the line and, a second later, you can penetrate the line to the left and be on the verge of killing yourself. Sudden and unexpected damage may be done to an aircraft by overstressing the wings, or overspeeding or overtemping an engine.

Now draw a second vertical line (Fig. 2).

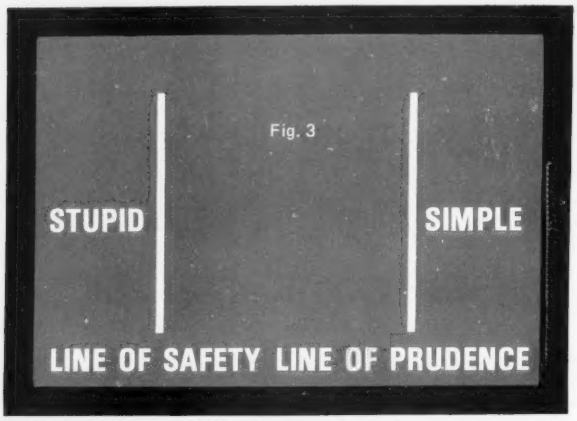
I will call this the *line of prudence.* Although at times it may be difficult to understand this line, it is very easy to see. It is very precise because it stands out in black and white. This line is formed by the many rules and regulations of our profession. OPNAV 3710, NATOPS, and SOPs make up the bulk of the *line of prudence.* Obviously there is a buffer zone between the *line of safety* and the *line of prudence.* A lot of experience has gone into drawing this prudence line. You could almost call it a line of "lessons learned."

The beauty of the *line of prudence* is that, as long as you operate to the right of this line, you are virtually assured of safe operational flying. Thus, we have minimum altitudes for



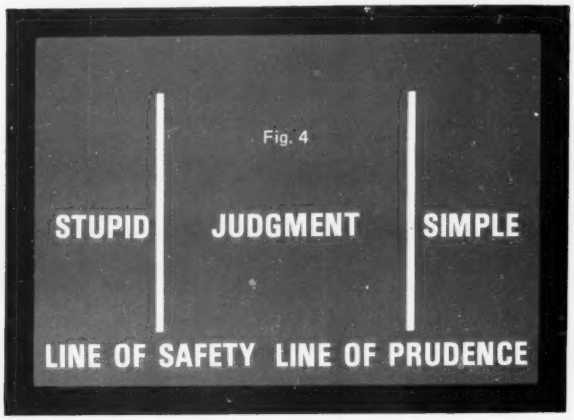
low-level flying, and ACM hops have to include special items in the brief. Checklists must be used, and most procedures are standardized. Experience and statistics have shown that staying to the right of the *line of prudence* will prevent you from approaching, much less penetrating, the *line of safety.*

Now that the chalkboard is divided into three zones, it is appropriate to name them. In keeping with the old saying, "Keep it simple, Stupid," I will call the area to the right of the *line of prudence* "simple," and the area to the left of the *line of safety,* "stupid" (Fig. 3).



I feel these names are most appropriate. Should one penetrate the *line of safety* to the left, he is begging for trouble and disaster. Indeed he has entered the stupid zone. If one stays to the right of the *line of prudence,* safety-wise, you are in the simple zone. In this zone, either nugget or expert can operate to his heart's delight in a safe manner.

This leaves the final, middle zone, that buffer area. I will call this the *zone of judgment* (Fig. 4). The judgment zone is not inherently dangerous, but danger lurks in that it borders the line of safety. Thus, the judgment zone is like a caution zone; it calls for experience, wisdom, professionalism, and caution to form the basis for sound judgment. Safety demands these characteristics.



When operating, you can leave the simple zone and penetrate the *line of prudence,* into the judgment zone, without necessarily endangering your aircraft. However, you had best be careful, because it is only your own judgment which protects you from the *line of safety.* Recall,

the main problem with the *line of safety* is that it is hazy in appearance and very thin. Also, at times, the buffer zone between the *line of prudence* and the *line of safety* is surprisingly small. The danger associated with the judgment zone is greatly dependent on your individual good or bad judgment.

Now that I have drawn the big picture of operational safety, how do I apply it to each of us? First, let's consider the nugget, the third pilot, or the wingman. Those who fall into this category have a fairly simple goal or directive, which is to always operate in the simple zone. Follow all rules and directives at all times. Older and wiser aviators, who preceded you, have passed on the very clearly defined *line of prudence.* While you gain experience and expertise, keep it simple and never penetrate the *line of prudence.*

Your next stage of development finds you flying as copilot, flight lead, etc. Being flight lead is not so much a license to penetrate the *line of prudence* as it is a recognition of your maturing judgment not to penetrate the *line of prudence.* The demands of operational flying may often tempt you to penetrate the *line of prudence.* Hopefully, your growing experience and understanding will be the basis for making the judgment not to give in to this temptation. In fact, most such temptations are associated with expediency or convenience. With a little effort and imagination, all operational demands can be met while staying in the simple zone. The good flight lead rarely, if ever, penetrates the *line of prudence.* His sound judgment tells him that it is just not necessary to cross the line. Thus the flight lead does not simply follow rules blindly, he has grown to understand and appreciate the *line of prudence.*

Next, you find yourself a division lead, plane commander, etc. The temptations to penetrate the *line of prudence* are constant. In fact, operational demands may require you to enter the zone of judgment. However, like the good flight lead, you will discover that most temptations are still based on expediency or convenience. Nine out of ten times you can find ways to meet all commitments while staying in the simple zone. For those times when you feel required to penetrate the line of prudence, you will do so with caution, forethought, and planning. You should enter the judgment zone only as far as required, and you should return to the simple zone as soon as possible.

This, then, is our relationship with the big picture of flying safety. The obvious byline is "stay simple, don't be stupid." Unfortunately, this is not as easy as it seems. We must remember that the *line of prudence* is drawn by men, and it can be changed or broken by men. However, the *line of safety* is a statistical reality and is unforgiving. The two lines are very different, but I feel we confuse them. In fact, there is a real buffer zone between them, and there is no buffer at all in the stupid zone. One thing that should be kept in mind is that you are definitely responsible for all actions when you penetrate the *line of prudence.* The name "judgment zone" is doubly appropriate, in that your judgment is definitely on the line, both from a safety and a professional point of view.

Now I can return to my initial question: Why do good aviators do dumb things? I think it is because they don't understand these three zones of safety, nor the difference between the lines of safety and prudence. By not fully understanding which rules apply to which of the two lines, they frequently operate carelessly in the zone of judgment. This is done in ignorance, and they set themselves up to suddenly and unknowingly penetrate the *line of safety.*

What may perhaps be unfortunate is that penetrating the *line of safety* does not always produce disaster. In a certain sense, it would be nice to get a caution light immediately upon crossing the *line of safety.* In this way you would always encounter a significant problem which would force a response; hopefully, to return immediately to the simple zone. Unfortunately, it's never quite that clear. There are those times when an aviator penetrates the *line of safety* but returns unscratched. This leads to a false sense of security and an erroneous belief that there is a buffer between the *line of safety* and disaster. ◄

The Eagle No Longer Flies

AN SH-2F crew was flying a day, training flight in the pattern at Camp Pendleton. While flying the downwind leg, at 300 feet, the *Sea Sprite* collided with an eagle. Just prior to the midair, the crew spotted the eagle and took evasive action. However, they were unable to avoid contact. The eagle hit one main rotor blade, knocked off a tip cap, and caused several cracks in the same blade. The helicopter landed without incident. Fortunately, both pilots were wearing their visors down and did not incur any facial or eye damage. The eagle wasn't so fortunate!

Preflights and Daily Turnaround Inspections

By LT Michael G. Thomas
NAVSAFECEN LAMPS Analyst

IN most aircraft, especially rotary-wing, poor preflights and other required inspections are often the last steps in a sequence of events that eventually leave you retired on that proverbial farm.

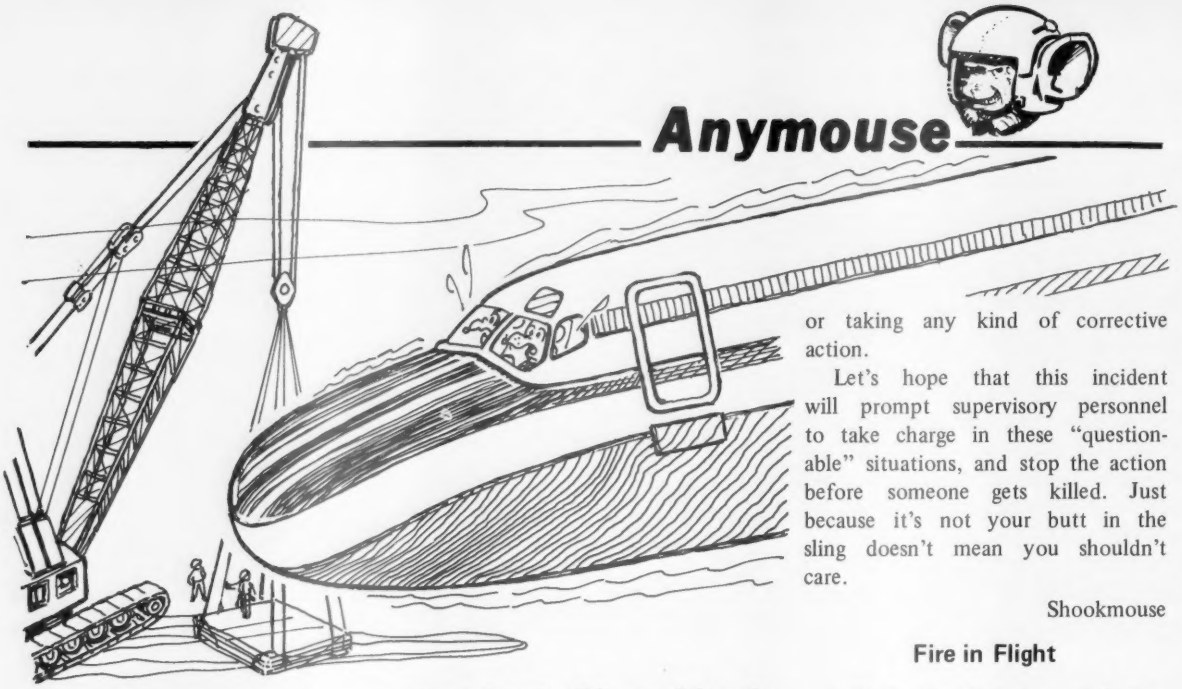
Most helicopter's panels, doors, cowlings, and windows all fit together like a 1000-piece jigsaw puzzle, and any piece that departs in flight can cause a disaster.

During the period of CY-68 through August '77, 847 panels, cowlings, windows, and doors separated in flight and became potential mishap culprits. Several tail rotor and main rotor blades were damaged, and three fatal mishaps occurred, claiming nine lives.

The causative agents for this "rain" of parts are numerous. They include material failure, design problems, and of major concern here, human error. The statistical percentages of human error (for inflight separations) for each model helicopter are as follows: H-1 – 28.4 percent; H-2 – 20.0 percent; H-3 – 21.1 percent; H-46 – 22.1 percent; H-53 – 18.7 percent. These percentages indicate that approximately one in every five reported instances of inflight separation was caused by someone not doing his job, a momentary distraction from the task at hand, or numerous other causes.

As pilots, aircrewmen, and, of course, plane captains, you have inspection duties assigned that must be fully and competently completed. NATOPS manuals and pocket checklist preflight inspections, as well as daily/turnaround inspection checks, must be followed to the letter. Remembering after takeoff that you forgot to check something you thought you had memorized is too late! You may have already unwittingly been the last step in the loss of an aircraft or, more importantly, a life.

Anymouse



Just a Blip Away

ON a recent night PAR approach to the duty runway at NAS, with weather reported as 300 feet overcast, 1½ miles visibility, the crew of a transport was advised by GCA that a 130-foot dredging crane was operating three-fourths of a mile from the approach end and just to the left of runway centerline.

The aircraft broke out of the overcast at approximately 300 feet AGL, 1 mile from the runway, slightly right of centerline, and continued the approach to minimums. At Decision Height, the crew noticed that the crane's location was at the MAP point, slightly left of centerline with the top of the crane being above the aircraft!

The GCA controller later informed the flightcrew that he had the crane on radar and was offsetting the aircraft so as to keep it a "blip away" from the crane. The crew was not informed of this during the approach. One could cite a lot of "what-ifs" which would have turned this incident into disaster, but the overriding problem of this incident was lack of communication.

The air station was aware that the crane would be routinely operating off the approach end of the runway, but was told that its operation would be limited to daylight hours. However, the dredging company was running behind schedule and decided to continue operation throughout the night without notifying the air station. Nevertheless, the air station was aware of the crane's operation that night and confirmed that the crane was a hazard, but decided to live with the hazard instead of suspending PAR approaches to the runway or temporarily raising the Decision Height, or taking any kind of corrective action.

Let's hope that this incident will prompt supervisory personnel to take charge in these "questionable" situations, and stop the action before someone gets killed. Just because it's not your butt in the sling doesn't mean you shouldn't care.

Shookmouse

Fire in Flight

I WAS scheduled for a defensive tactical syllabus flight in an A-4. During preflight I remember checking the fuselage fuel cell door. It was closed. However, being a trusty soul (last time), I didn't check that the fuel cap itself was secured. Although NATOPS is quite specific that pilots ensure all fuel caps are secure, I'd guess that pilots don't check them more than half the time.

I launched, and later in the flight, during an intercept, I saw fuel venting from the aircraft. I called my wingman and knocked off all maneuvering. I checked my fuel state with him. We were close enough.

We headed for Homeplate and made routine landings. During preparation for fueling, the plane captain saw the fuselage fuel cell cap not secured. Investigation revealed fuel residue in the upper avionics

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT
PREVENT AN ACCIDENT

hump and in several avionics components. The fuel path was traced through the aft section of the airframe and pooled in front of the drag chute canister, where it was ignited during flight.

The NATOPS manual and servicing manuals call for the plane captain to ensure that wing and fuselage fuel cell caps are secure during daily and preflight inspections. The plane captain remembered seeing the access door closed and locked, but he didn't check the cap. The fueling crew should have ensured the cap was secured. They didn't either.

The fire was short-lived and did limited damage. The firewarning light didn't come on, although the fire burned within a couple of inches of the fire detection element. I was

sitting on a bomb and didn't even know it.

My good fortune was tremendous. Why the plane didn't blow, I'll never know. One thing for sure, in this squadron everyone knows about it, and you'll find the most religious fuel-cell-cap checkers in the world – the refuelers, the plane captains, and the pilots. I accept the blame for this close call and will not be involved in another delta sierra such as this.

Hotmouse

Speed Demon

A recent incident involving the operation of a squadron vehicle and a taxiing aircraft brought to mind the dual responsibility demanded of me as a work center safety petty officer. I was operating a vehicle in the vicinity of the line when an aircraft approached from the side. In an effort to avoid the jet blast of the aircraft, I sped up to an excessive rate rather than stopping in place until the aircraft had cleared. My preoccupation with getting ahead of the aircraft resulted in operating the vehicle in a dangerous manner. Reflecting on this seemingly harmless incident reminded me of two important points which I feel are worth sharing.

First, as a second class petty officer, special trust and confidence has been extended to me which requires my setting an example for others. My actions in this incident were clearly substandard. Secondly, as the safety petty officer for my ship, I shoulder an additional responsibility of not only setting an example, but to encourage others to keep safety foremost in their minds at all times. I am relieved in knowing that this incident did not result in a serious mishap, and as a result I am more keenly aware of my dual responsibility.

Moreawaremouse

Tell It Like It Is

RECENTLY a pilot in our squadron was giving our new air wing commander a cockpit refresher brief which included a ground turn. When it came time to light the fires, they did so despite the fact that only 1000 pounds of fuel was indicated. There was an outstanding fuel quantity indicator gripe. The result of this was a dual-engine flameout due to fuel starvation. The fuel quantity indicated 800 pounds at flameout. The low pressure collapsed the fuel cell bladder. The aircraft was out of action for over 2 months during a deployment.

An incident report was not drafted

in an attempt to "keep it quiet," to avoid embarrassing those involved. The squadron aircrews were not briefed; however, most members, JOs in particular, found out the facts via the grapevine. The result has been: 1) a loss of confidence in our leadership; 2) the chance that others won't admit and brief mistakes in more crucial areas; and 3) the chance that the same mistake could be repeated in our squadron or in the community.

Disillusionedmouse

Rappelling

IT is standard operating procedure for crewmen assigned to SAR duty in mountainous areas to practice rappelling techniques. Rappelling is a procedure frequently used by SAR crewmen to leave a hovering helicopter, by a rope, to perform a rescue when it is impossible to land the helo.

The crewmen use a standard piece of mountain climbing equipment called a sky genie. They attach one end of a 300-foot rope to the rescue hoist on the aircraft, while the remaining rope is thrown to the ground. They also wrap the rope two or three times around the sky genie, hook the genie to the body harness, and slide out of the helicopter. The number of wraps on the sky genie determine the braking power of the rappeler. In addition to the braking power of the sky genie, the rappeler can control his rate of descent by manually feeding the rope through the sky genie with his hands.

A problem can arise when a rappeler has to determine how many wraps on the sky genie are necessary to achieve a desired rate of descent. There are three variables in determining this:

- The weight of the crewman – the heavier the body, the more the wraps.
- The condition of the rope – older ropes slide easier.

• The condition of the sky genie – some slide faster than others.

Two pilots, a crew chief, and a rappeler were conducting a rappelling training flight one day in a UH-1N. The rappel, to be performed by an E-6, was briefed, and the flight became airborne. The crew chief, also a qualified rappeler, assisted the E-6 in rigging the gear. The rappeler had two wraps but decided on another half wrap.

Coordination was affected with the pilots to make a precision drop to an "X" painted on a mat in an exercise area. The pilot came to a 100-foot hover, the crew chief threw out a weighted bag and the line to the deck, and the rappeler was cleared to go. At the last moment, the crew chief checked and locked the rope around the sky genie, a procedure which the rappeler had overlooked.

All was ready, and the rappeler stepped out on the helo skid and proceeded down. His right hand was in the proper position as he began his descent. This time, however, he did not slow his descent enough. At about 40 feet above the mat he began braking, but he was going too fast. The rappel brake didn't slow him down enough, and the rope running through his right hand was h-o-t. The rappeler was wearing nomex, summer, flight gloves, and the heat buildup was too

much to make braking bearable. The rappeler hit hard on the asphalt with both feet, fractured both heels, fell backward, and was knocked unconscious.

The crew chief in the helicopter advised the pilot to call for an ambulance. While the ambulance was on the way, the pilot landed and the crew chief rendered what help he could. The injured rappeler was treated at the local dispensary and then transferred to a naval hospital.

To enhance safety in rappelling, the command now requires rappelers to use heavier gloves, to lessen the chance of rope burns, and has decreed that practice rappelling will be conducted over soft, dirt surfaces. ◄

WIND HAZARD WARNING SYSTEM

ENGINEERS at FAA's National Aviation Facilities Experimental Center (NAFEC) are nearing completion of a new detection and warning system that will alert pilots to the presence of hazardous wind shear conditions.

NAFEC Acting Director Joseph M. Del Balzo said the present schedule called for the experimental center to hand off the low-level wind shear alert system (LLWSAS) to FAA's Airway Facilities Service as a fully commissioned system in March 1979. The system is scheduled for installation at 60 U.S. airports over the next 3 years and is in seven already.

The low-level wind shear alert system is designed to detect significant changes in the horizontal speed and/or direction of air in a horizontal plane approximately 30 feet above the ground. Meteorologists have observed changes in windspeed and direction as high as 100 knots and 180 degrees near the surface.

Caused by thunderstorms and fast-moving weather fronts, low-level horizontal wind shear can be particularly dangerous to aircraft during takeoffs and landings when the pilots may not have adequate altitude to recover from sudden, major wind shifts. This shearing or scissoring action of invisible wind layers has been documented by the National Transportation Safety Board as the cause of at least seven U.S. air carrier accidents since June 1973. One NAFEC investigator lists it as a possible factor in 25 large-aircraft accidents since March 1964.

The worst of the seven NTSB-documented accidents occurred on June 24, 1975, when Eastern Airlines Flight 66 encountered a strong, low-level wind shear during an approach to John F. Kennedy International Airport and crashed, killing 115 onboard.

The basic system, as defined by NAFEC engineers and meteorologists, consists of six Vector Vane wind sensors. Five sensors are positioned around the perimeter of the airfield about 1 mile from the ends of the main runways. The sixth sensor is located as close as possible to the airport geographical center point. The sensors are mounted on poles 20 to 65 feet above the ground, depending on the terrain.

Data from each of the sites are transmitted by radio link to a minicomputer in the control tower equipment room. The computer processes the data and determines whether the results exceed the predetermined alarm threshold. This is a 15-knot wind vector difference between measurements at the center site and one of the perimeter sites. If the computer determines that the threshold is exceeded, it sets off two audible alarms on the control tower and starts flashing the critical digits on a display in the control tower console.

Once the pilot is advised of these conditions by the controller, he can take appropriate action such as adjusting engine power setting to cope with the wind conditions, holding, requesting an alternate runway, or executing a missed approach and landing at another airport.

On December 12, 1978, NAFEC project engineers and Airway Facilities personnel met with FAA's specification review board to discuss the first draft of production specifications for LLWSAS. Following approval of the final production specifications and certification standards, the low-level wind shear alert system will be officially declared fully commissioned and handed off by NAFEC to the Airway Facilities Service.

NAFEC engineers will continue their work on a version of LLWSAS in which the data from the ground sensors will be transmitted directly to a cockpit display by means of the data uplink on the new Discrete Address Beacon System surveillance radar under development at the Center.

Courtesy Public Affairs Office
FAA/National Aviation Facilities
Experimental Center

Frosty face

THE T-2's copilot, a flight surgeon with 15 hours of jet time to his credit, strapped in and donned his A-13A oxygen mask while waiting for the pilot to complete his preflight procedures. He was able to breathe, with slightly excessive pressure, but after approximately 5 minutes he complained that the oxygen felt unusually cold when inhaled. The pilot instructed him to remove the mask and secure the O_2. At that time, the pilot noticed that his copilot's face was covered with frost. Also, a white vapor was observed coming from the dangling flight surgeon's mask! Attempts to secure the flow by the console switch were unsuccessful. Upon return to the line, the entire mask, lower block, and on/off switch were frozen and covered with a thick coating of frost. The flight surgeon was taken to the dispensary where he was treated for first-degree LOX burns on his face.

Maintenance inspection of the copilot's mini-O_2 regulator revealed an incorrect adjustment of the paddle assembly. This permitted the gaseous oxygen to pass through the mini-reg at a much faster rate than designed. The resultant lack of back pressure at the converter allowed the oxygen to pass through the heat exchanger so fast that it could not warm the gas sufficiently to prevent the freezing of downstream components . . . and the flight surgeon's face!

Subsequent tests were conducted on other aircraft (A-6, A-7, and another T-2) with misadjusted mini-regs, and the results were similar. The T-2's test took the shortest time to freeze/frost up the unit. The point proven to all should be: keep your life-sustaining equipment in good working order by following the PM (preventative maintenance) schedule of those that require it. Furthermore, if you're not a regular flightcrew member of a particular aircraft, make sure you are thoroughly familiar with the life-sustaining systems of that aircraft before flight. The unfamiliarity of this copilot prevented him from realizing that there was a problem when he originally encountered the excessive pressure. Keep up to date on all your systems at all times, and prevent unnecessary mishaps. Accidents can be prevented if you work at it . . . it's a proven fact! ◄

LOST COMM

By LT A. P. Clause
VP-48

REMEMBER those last few weeks of flight training at Corpus Christi when we studied lost comm because we had to know the procedures COLD for the last instrument checkride? It was time well spent, for most of us encountered an actual lost comm situation in the old single-transceiver "Whisper Stoof." But chances are your lost comm skills are a little rusty if you've been flying P-3s, right? Well, hang on to your dead mike, Mister, it's just possible your multimillion dollar machine could let you down! Here's how.

An early morning brief for a 7-hour reposition flight to Japan. Twenty-three happy people. All are well rested from 4 days of Cubi liberty. They load their souvenirs and luggage aboard. The weather at takeoff time will be IFR. With a ceiling of 700 feet, we don't expect to break out until 14 thou. Whew! The PPC will be doing the takeoff, with a nugget riding the radios.

Navy 123, this is Cubi Tower. Contact Cubi departure on 127.5. The wind is 250 at 10, you're cleared for takeoff.

Roger from Navy 123.

"Okay, takeoff checklist is complete; all you guys ready to go? Ah, standard back up on the takeoff; rotate at 123 . . . . we better use max power; here we go." *(The P-3C glides down the runway and soars into the air like a beautiful bird.)*

"Hey, pretty smooth takeoff, slick."

"Yeah, yeah. Set 4 and gimme the climb checklist."

"Okay. Gear's up, flaps up. Wait a second, let me give departure a call."

"Mornin' Cubi, Navy 123 is with you climbing to FL240." "Hey, there's no side tone on the VHF and all the lights are out on the comm selector panel."

"OK, let's get the IFT (inflight technician) to the cockpit. Hey, the ICS and PA are out too. Okay, someone run back and get the IFT up here."

"You wanna hit the IAF and shoot the TACAN back in?"

"We're on a vector out of here. Ah, let's see, we're supposed to keep on going, but I don't want to fly 7 hours to Japan lost comm! Let's squawk EMERGENCY and LOST COMM and we'll hold at the IAF while we figure it out."

"Okay." *(IFT strolls into the flight station.)*

"What can I do for you, sir?"

"All the radios and ICS are gone! What could cause that?"

"All the radios? Both sides? Ah, let me check."

(Off duty pilot) "Want me to plug into the VHF in the back and try to talk to Cubi?" *(Remember that trick from the RAG?)*

"Yeah, good idea! Tell them we're going to hold VFR at 14,500 as published and try to fix the airplane. We'll continue home if the IFT can fix it. Otherwise, we'll want to shoot an approach back into Cubi for maintenance. Oh, and ask Radar to keep us out of the mountains."

"Okay." *(It worked. The off duty pilot talks to Cubi Approach and the aircraft is cleared to hold.)*

"Bingo! We got the radios back. That IFT is worth his weight in gold! Call Cubi and tell them we're continuing to Japan. What was wrong, IFT?"

"I found a loose wire on the ICS ripple amplifier, sir. It's OK now. We'll make it back to Japan no sweat."

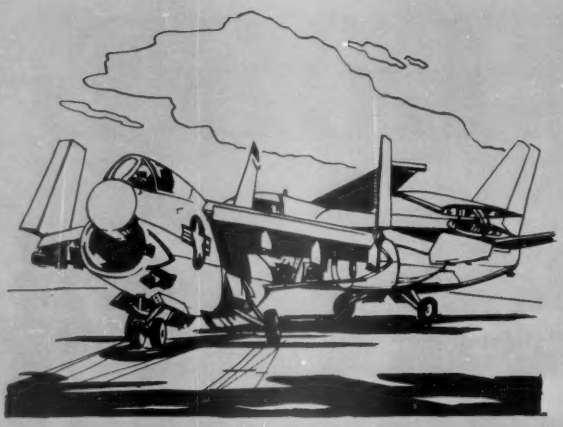
"Thanks. Let's review the climb checklist, get our clearance, and get out of here."

So, another mighty *Orion* flies off into the sunset (finally), but there are several lessons to be learned. What if the IFT couldn't fix the radios? What if the weather was worse? What if the flightcrew had partied instead of resting the night before? How good is your crew communication/coordination when lost comm is for real? ◄

FLATTOPS! What's going

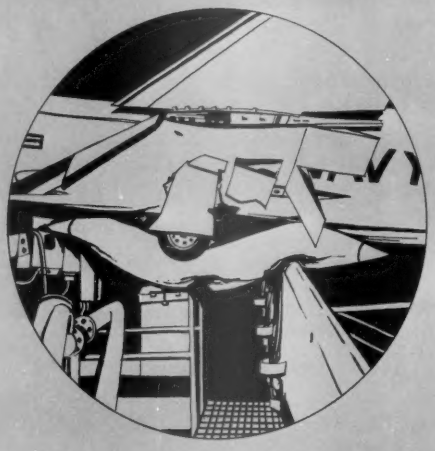
HARDLY a day goes by when one doesn't either hear, read about, or actually witness a mishap on an aircraft carrier's flight deck. They really seem to be haunting naval aviation more and more each day. Talk goes on about these "crunches" in readyrooms, offices, car pools, and at happy hour, but little seems to be done to reduce these "crunches." True, efforts are being tried daily to curtail these needless incidents involving aircraft, GSE, and personnel aboard the flattops. APPROACH has contained articles ranging from Air Breaks and Anymouse to feature articles on carrier incidents/accidents. There is no doubt that they are well publicized (probably to the chagrin of some in the chain of command). These "reports" are not made with intent to "finger" someone, but to bring the problems to the surface in hopes that *someone* comes up with a *better idea* and, in turn, reduces or eliminates these costly, and often tragic, mishaps.

The carrier mishaps are assigned one, or a combination, of the following factors: wet decks; POL on decks; jet/prop blasts; bad communications; simultaneous respotting/ship maneuvering; insufficient/untrained/unqualified personnel; lack of supervision; Mother Nature; disregard for SOPs; and the beat goes on – and on! Something more positive is going to have to be done, and soon, lest the Navy price itself out of the flying business. Using F-14s, A-7s, S-3s, catwalks, GSE, and personnel (yes, personnel) as aircraft chocks is too expensive, inefficient, and needless. Within a very short time, the following mishaps happened on the flight decks of carriers (and these are but a few):



• An A-7 was being taxied onto the No. 4 elevator in preparation for launch on No. 4 cat. The crosswinds were 40 knots, and the jet blast emitted from the tailpipes of the EA-6B (in tension) prevented the *Corsair* from aligning into the wind/blast. Despite efforts of all concerned, the A-7 was blown more than 30 feet to the rear and impacted an unmanned S-3.

• An F-14 returned successfully from a PMFC, only to taxi clear of the wires and slide into the catwalk, partially due to a slippery deck. The crew ejected. One was recovered; the other was not. The *Tomcat* survived.

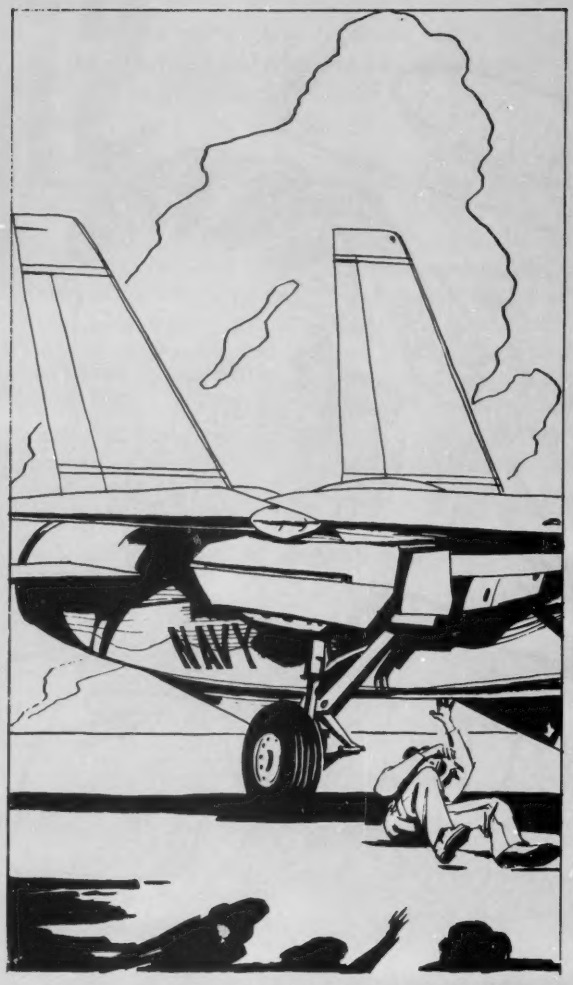


• The *Phantom* was in a six-point tiedown aft of the LSO platform. The deck roll was heavy, as the ship turned broadside to the abnormal sea swell direction. The magnitude of the roll caused the three-rearward restraining chains to fail, allowing the F-4 to roll back into the catwalk.

on out there?

• The A-7 was spotted in the "six-pack" area, forward and inboard of the island. A low-power turnup was performed. After completing the turnup, it was moved towards the waist cat for launch. En route, a maintenanceman ran alongside the aircraft. He was not aware that they were to pass directly behind another turning *Corsair*, 90 degrees to their taxi path. The force of the adjacent A-7 literally blew the man down and under the mainmount of his A-7. Before the incident could be prevented, the wheel of the *Corsair* severed the right arm of the maintenanceman. In addition to the severed arm, he received multiple injuries to other parts of his body. (In a similar incident, another maintenanceman was more fortunate and only received minor injuries when blown down the deck by a turning A-6.)

• During a night launch of an A-6 on cat 4, the final checker was struck in the back by the catapult approach ramp of cat 3, which had been placed next to the flight deck scupper rail. The checker, who was in the catwalk, was rendered unconscious, and received a bruised back.



• The F-14 was the last aircraft to be spotted for a fly-off the next day. While it was being towed between cats 1 and 2, a blue shirt tripped and fell beneath the wheel of the *Tomcat*. Despite emergency attempts to stop by all concerned, the wheel had rolled into the victim's body. The results were quite obvious – DOA!

These are but a few of the flight deck "crunches" that seem to never end. What is the real cause(s)? Probably not mentioned in the various reports received are factors like: tempo of ops, too much to expect with the caliber of personnel, complacency, long crew days (fatigue), trying to establish new records (ego), to "got-to-get-that-E" no matter what! If all this is happening out there, an accident is awaiting, that's for sure. Maybe it's time to reevaluate the "mission requirements versus safety" priorities. When and where does it start and end? Any suggestions or answers? Maybe **YOU** have a better idea. If so, let us hear it.

Sinking spells

During several days of irregular working conditions, you may be able to satisfy deep sleep requirements and maintain good efficiency by napping for short periods.

PICTURE this one. A high-altitude transport, passing Raleigh at the end of an all-night, nonstop mission, continued eastbound at FL370, not answering the clearances issued by Center to descend. After considerable time, effort, and anxiety, radio contact was established, but only after the aircraft was nearly 100 miles out to sea. Fortunately, the incessant chatter of several facilities was loud and repetitious enough to awaken at least one of the sleeping crewmembers. There was enough fuel left for a safe return to the planned destination.

The above scenario has not happened (or has it?) in military circles, but reports of similar circumstances have happened in other aviation communities. Cockpit slumber parties are one of the more dramatic effects of severe fatigue. Some say that such conduct is inexcusable, but that oversimplification masks some real physiological problems. Several factors contribute to sinking spells – some of them can be controlled.

Lack of sleep is the most obvious cause of pilot fatigue, but sleep is a complex subject that scientists are only beginning to understand. Basically, there are two significantly different types of sleep of interest to the aviator. *Deep sleep* predominates during the first half of a normal night's slumber and is characterized by very low electrical (EEG) activity in the brain. *Rapid eye movement* (REM) begins after that initial few hours and is a totally different kind of sleep. During REM sleep, EEG activity is similar to that found in the waking state. There are rapid eye movements and evidence of dreaming. Considerable research has established a clear need for both types of sleep. During several days of irregular working conditions, you may be able to satisfy deep sleep requirements and maintain good efficiency by napping for short periods. At the end of that time, your REM account will be overdrawn and that balance will need to be restored with at least one very long sleep. If, however, you miss an entire night's rest, you may be able to recover good vitality with a normal night's sleep plus 1 hour for the REM deficiency and an afternoon nap to balance the deep sleep account. Ten to 15 minutes of calisthenics after a short night's sleep is an excellent *temporary* substitute for the lack of rest.

Another factor to consider is hypoglycemia or low blood sugar, which can cause malaise, fatigue, disorientation, and even lapses of consciousness. It is controllable with some very simple dietary tricks, but it helps to understand the mechanisms involved. When you awake in the morning, your blood glucose level will be low from the overnight fast. If you start with coffee and sweet rolls, or any other highly-refined carbohydrates, you may induce reactive hypoglycemia. It works like this. Your system converts sugars and starches into glucose so rapidly that your blood sugar level rises at an abnormal rate. When the homeostatic system that balances glucose levels senses the sharp rate and rise, it signals the pancreas to release insulin proportionately. In this case, the rate is abrupt and can only be sustained over the very brief time it takes for your body to convert the refined carbohydrates to glucose. The end result is that too much insulin is triggered into the bloodstream so that your glucose volume is soon driven well below the original, fasting level.

Proteins from a more normal breakfast are processed by the body at a much more steady rate so that quantities of insulin are metered out to stabilize glucose levels at the optimum point. Protein reduction and conversion continues for several hours and eliminates the peaks and rebounds induced by pure carbohydrate intake. Four dietary practices will prevent reactive hypoglycemia:

- Avoid refined carbohydrates (sugar and all refined starches).
- Eat protein-rich meals every 4 hours, especially when on flight duty.
- Use fruit or protein snacks for pick-me-ups at odd duty times.
- Substitute low-fat milk or fruit juice for coffee and soft drinks. And speaking of *coffee*, there was an individual (aviator) who drank gallons of coffee and never could stay awake. It turned out that he suffered from caffeine toxicity, a common problem that can cause poor sleeping habits, nervousness, headaches, and lethargy.

Above a certain level, caffeine ceases to be beneficial and becomes a hindrance to normal functioning.

Coffee, tea, and cola, in moderate amounts, promote quick energy and clear thinking through the stimulant *caffeine*. Above a certain blood level, caffeine ceases to be beneficial and becomes a hindrance to normal functioning. One cup of coffee or tea contains about 100mg of caffeine. Twelve ounces of cola contains about 50mg. Some doctors feel that 500mg per day is enough, 750mg is questionable, and 1000mg addictive. Check your caffeine intake and be sure to include all the possible sources. Coffee, tea and cola are obvious contributors, but caffeine is also present in chocolate and in many non-prescription headache and cold medicines and over-the-counter stimulants.

Cigarettes. Now, about these nicotine and tar-producing weeds! One smoke raises the carbon monoxide in the blood to a level that equates to a state of hypoxia at 7000 feet. Two cigarettes, smoked consecutively, raise the level to 10,000 feet! These levels are *further aggravated* by actual cabin altitude. Smoking is unquestionably a contributing factor to fatigue. Still, the abuse goes on.

To sum it all up – when drowsiness occurs, try light exercise, fruit juice, and protein-rich snacks instead of cigarettes, coffee, and soft drinks. Try the change and feel the remarkable difference!

Adapted from *Aerospace Safety*

The photographs accompanying this story were taken as the actual events unfolded, by LCDR Mancias. None of the photos were staged or posed. – Ed.

Let this be a lesson!

(Fasten Seatbelts)

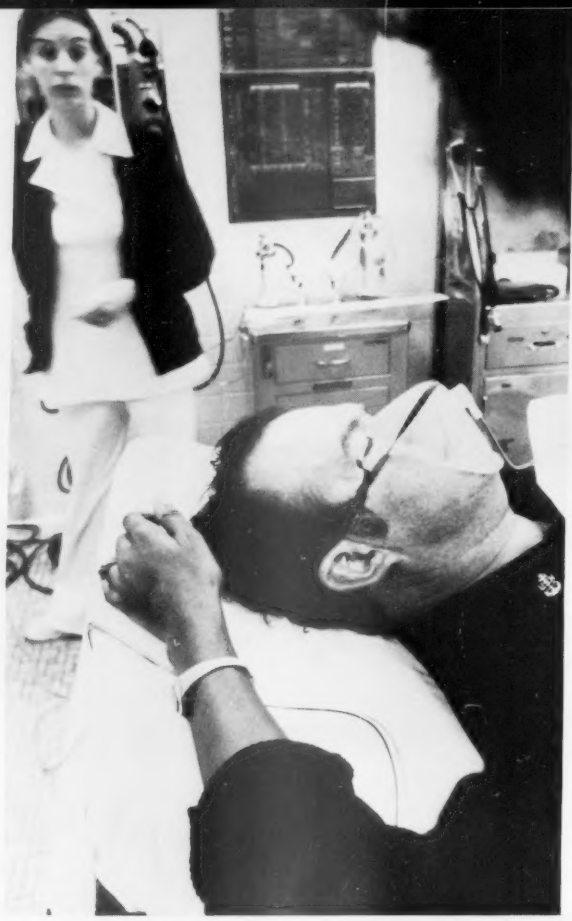
By LCDR J. Mancias, Jr.

NAVY 145963, a C-131 *Convair* piloted by CDR Jerry Sidner and co-piloted by LT Stevan Melton, was cruising at FL160. They were tooling along V-323 about 20 miles south of Macon, with the cabin altitude set at 3000 feet. Onboard was a group of Naval Reserve LANTFLT Audio Visual Unit 193 members. The flight-crew and passengers, 13 in number, had traveled together for 9000 miles during a filming project, and were on the last leg inbound to Pensacola.

PHC Gerry Costello was the director of photography. He and his group had completed their filming and were pleased with the result – almost 2 miles of film. Chief Costello was dozing in his seat, belt fastened, thinking about the make-believe world of motion pictures. In a moment, everything was blanked out by the shock of decompression and sheer terror.

The window next to Chief Costello blew out without warning. Magazines, box lunches, hats, flight jackets draped on the backs of the seats, and other loose items were sucked out. Chief Costello's aircrew wings were ripped off his shirt, his loosened tie became a noose, his tie tack and the contents of his shirt pocket including eye glasses, case, and pen were all sucked out.

CWO Ken Smith was sitting in the aisle seat, next to Costello, and immediately locked his arm around the chief. The noise of the rushing air and the cold temperature (-15°C) gave everyone the shakes. The copilot was in the cabin, on his way back to the cockpit, when the window blew



out. He quickly linked his arm to CWO Smith's to help pull Costello from the suction.

CDR Sidner was notified of the problem and told Center he was making an emergency descent. LT Melton called for oxygen for Costello, who was hyperventilating. Many hands joined in removing Costello away from the window. CDR Sidner landed a few minutes later at Warner Robbins AFB. An ambulance and medical help were onhand as the C-131 rolled to a stop. Chief Costello was taken to the dispensary, checked, and later released.

The aircraft had operated over the past 3 months in unpressurized flight, due to a faulty pressure controller and pressure outflow valve. However, these were replaced and, until the incident, had operated under pressurization for many hours with no discrepancies noted in the system. Investigation revealed corrosion of the outer window, which caused delamination between the mounting flange and the plate glass. The plate glass blew out, with the mounting flange still intact with the aircraft.

Chief Costello, who is a cinema-photographer for Grumman, has hundreds of hours in F-14s, A-6s, F-5s, and A-3s. His testimony on the value of seatbelts bears repeating: "For those of you who don't use seatbelts, let this be a lesson. I wouldn't be here if I hadn't had it on."

APPROACH commends all who participated in the drama over Georgia with a resounding Attaboy!

Are you freq'd out?

By LT Bob Francis
VP-0919 Pilot NATOPS

AS military pilots, we are accustomed to almost exclusive utilization of UHF frequencies for air traffic control communications. Perhaps this is an inbred trait learned from many years of operating solely in a military environment or solely in aircraft equipped with only UHF capability. Admittedly, there is often no problem presented with this exclusive use of the UHF band. However, the unwary pilot who is equipped with both UHF and VHF communications capabilities may be leading himself into an ever-so-subtle trap by insisting on using UHF in a VHF environment.

While operating in and around military airfields, certainly almost all traffic, save for the occasional Aero Club aircraft, are communicating on a UHF frequency. However the military pilot who files to a civilian airfield and insists on exclusive utilization of UHF, be it out of sheer force of habit or whatever, is isolating himself and his cockpit crew from all other traffic at that airfield. By not monitoring or employing the VHF spectrum, the military pilot in this situation is almost totally unable to monitor other aircraft positions and is entirely dependent on the tower/approach control agency for other aircraft advisories or traffic situations. In effect, this UHF pilot has taken himself out of the information loop.

Perhaps the most poignant example of the potential dangers of a "split frequency" situation can be readily seen in the high-density area holding pattern situation. It certainly enhances safety of flight and does wonders for an aircraft commander's peace of mind to have all aircraft on the same frequency. This adds an extra measure of quality control where each aircraft can monitor and check assigned holding altitudes in relation to his aircraft. How many of us have found ourselves in the same holding pattern at the same altitude as another aircraft only because we heard the other guy check in on the same frequency?

Taken one step further, the UHF aviator operating in the VHF environment is also isolated from potential assistance from other aircraft in his vicinity. Air traffic control communications difficulties are often easily remedied through other aircraft relaying frequency changes, clearances, instructions, etc. if, and only if, everyone is frequency compatible.

In conclusion, perhaps frequency utilization is best left under the category of good headwork. Consider your environment and make your choice. It can be said that working a frequency can be compared to buying a house. You look in, at, and around *all* of it to ensure that you see all there is to see. The more you expose yourself to what is there, the more you learn and the safer your investment. Let the unwary pilot beware, for "what you don't see" (or hear) may be "what you get." ◄

Letters

Let the E-2 Help!

Washington, DC – No naval aviator would dispute the bottom line in "Group Grope on a Bingo," CDR W. R. Needham's article on pg. 27 of your MAR '79 issue: "You must be prepared for as many contingencies as possible. Expect the unexpected. Consider all those things which can affect your decision if the situation arises. Your life may depend on it!" However, though all the details are unknown in this particular case, there is a better way.

In the specific case cited, 14 aircraft were involved, one of which was an E-2. This aircraft has the proven capability to convert a "group grope" into a calm, professional, naval maneuver. (About 2 years ago, a blackout on the USS SARATOGA, the topic of an APPROACH article, dramatically illustrated this point.) Consider the following scenario.

After a 35-minute recovery delay, resulting in the classic "skosh" fuel state all around the pattern, Marshal notifies the *Hummer* of the bingo decision and directs a station offset between ship and shore to facilitate the bingo. The E-2 pilot proceeds to a station selected by the CICO (NFO in charge of the mission). The copilot makes initial contact with the bingo destination and Center. These calls will alert the field and Center of the situation. They will also allow the E-2 to determine exact field conditions and weather to be anticipated by the bingo birds. (So much for a "jumble of information" received at the Center.)

Meanwhile, Marshal passes the word to bingo, at marshal altitudes, and passes control of 12 aircraft to the E-2. Establishing positive ID via IFF, etc., the three E-2 controllers determine altitude and airspeed desired by each bingo bird, assign these under positive control, monitor fuel states for aircraft priority, and provide navigation vectors for TACAN, precision, or VFR approaches as required.

Note that the entire evolution can be under *positive control.* Tanking can be facilitated by the E-2 or the CV. The five E-2 UHFs can be utilized for CV, field, Center, and aircraft control. Navigation errors are eliminated. Radio confusion at Center, field, and aircraft is minimized. Pucker factor, and the associated "cockpit oriented" problems of tunnel vision, are reduced because there is that warm feeling that somebody out there loves you (the E-2 crew).

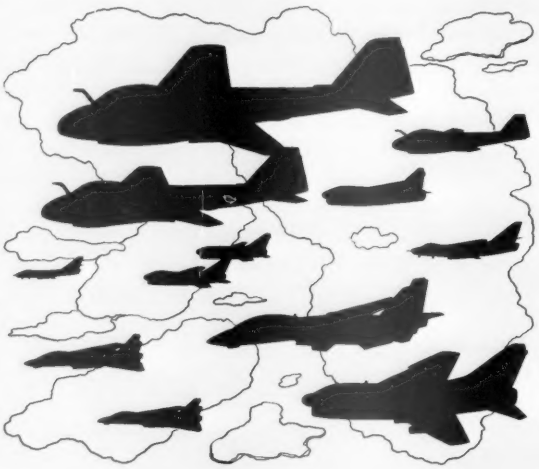
As appropriately noted by CDR Needham, "There are, of course, other problems that can arise . . ." This feeling is often characterized by, "They are trying to get me – again." CDR Needham stresses that "You must know what you are going to do if . . ." When that "if" involves a secondary divert, loss of navaids, lost comm, weather . . . or (worst case) the silk approach, the E-2 can, has, and will come to your aid.

The moral of the story is simple: put the E-2 into your bag of tricks, and ensure your ship/air wing doctrine includes it in theirs.

Okay, I hear you. There are, regrettably, a few occasions when the E-2 is, shall we say, indisposed. The VAW community feels these occasions are becoming very scarce. In the case cited in the article, the *Hummer* was available. Remember, when you're out of E-2s, you may be out of control. **Don't be when you don't have to be!**

LCDR A. S. Polk III
Formerly of VAW-126

● **You've made an excellent point that should be considered by all carriers and air wings when bingos or similar situations arise.**



APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request. Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, VA 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

Fear of Not Flying

Washington, DC – As a "qualified" and "current" pilot on DIFOPS orders to a headquarters staff, I read your lead article in the APR '79 issue anticipating another roadblock for staffees chasing CNO minimums. Unfortunately, I was not disappointed.

The *Skywarrior* pilot whose NATOPS qualification had expired should, of course, not have been allowed to fly the mission prior to requalifying. However, it appears from the article that the command adequately screened the *Skyhawk* pilot's logbook. It does not appear that the *Skyhawk* pilot's qualifications, currency, or proficiency were a factor in the accident. The unbriefed and unauthorized maneuvers performed by this hapless *Skyhawk* driver would have been difficult to perform by a pilot logging 30 hours a month. The equation of *proficiency = good headwork* is not one of the fundamental laws of naval aviation.

You have done a disservice to the professionals among us on DIFOPS orders in staff billets by broadly implying that the pilot attempting to achieve CNO minimums is likely to flathat. This article appears to serve notice to reporting custodians that they are liable for supervisory error should a pilot from a staff command break one of their aircraft. As a pilot on a staff, I'm disgruntled to see an attitude fostered that will probably make it even more difficult to maintain proficiency.

LCDR Carl Tankersley
NAVAIRSYSCOM

● Our article was certainly not intended to act as a "roadblock" to staff pilots receiving their share of flight-hours. It was aimed at reporting custodians and all aircraft supervisors in an attempt to remind them that they are responsible for the use of their aircraft, no matter who is flying them. The point was that considerations such as level of proficiency, type and difficulty of mission, legal qualification, solo or accompanied, etc. should be carefully considered before giving an unfamiliar pilot your aircraft.

In a Hurry

FPO, San Francisco – While we held short for takeoff, an F-4 taxiing from another direction was cleared for takeoff – although he was still only halfway down the taxiway. I didn't understand his priority but waited patiently to let him go ahead.

I saw that the F-4 control checks were performed uneventfully. However, when the pilot selected afterburner, shortly after brake release, I observed something depart the port wing of the *Phantom.* I reported it to the tower, and a yellow truck came out to pick up whatever FODed the runway. Three more aircraft and I waited. The FOD turned out to be an F-4 NATOPS checklist.

Obviously this NATOPS checklist wasn't doing its job, and some good intentions were at least partially wasted. Would you believe the old axiom – haste makes waste?

LT R. J. Paul
VS-38, Ground Safety

● Maybe a new final step to the F-4 preflight checklist is in order. Something like – "Now close the cover and place this checklist inside the cockpit, in a safe place. That's a good boy!"

Clarification on New River

MCAS(H) New River – In reference to the MAR '79 APPROACH, specifically the article on MCAS Cherry Point, the article was well written and informative except for one paragraph concerning MCAS(H) New River. I personally take exception to that paragraph and believe it to be an affront to my fellow controllers stationed at New River.

Anyone not familiar with the circumstances which prompted the lengthy delays for IFR clearances at New River could very easily assume the problem was precipitated by the controllers at New River, and was somehow eliminated by the "superior" controlling abilities of controllers at MCAS Cherry Point. A closer view of the circumstances which prompted the lengthy delays would show the contrary. Prior to Cherry Point becoming the approach control for New River, Washington Center provided approach service and, prior to that, Cherry Point. Lengthy delays evolved not from controller shortcomings at New River, but from Center's en route traffic and Cherry Point's terminal traffic being given priority over New River departures.

New River, under a letter of agreement with Cherry Point, has assumed control over all IFR departures and arrivals. Clearances are received from Washington Center via Cherry Point, but release and controller-to-controller handoffs are effected by New River GCA. The result is the reduction of lengthy delays for pilots once routinely encountered at New River.

In closing, I'd like to say that your articles are excellent, and I encourage you to keep up the good work.

SSgt J. D. Turner, USMC

● We did not intend to imply that the delays at New River were caused by the MCAS(H) controllers. Our only point was that the new system eliminated these delays.

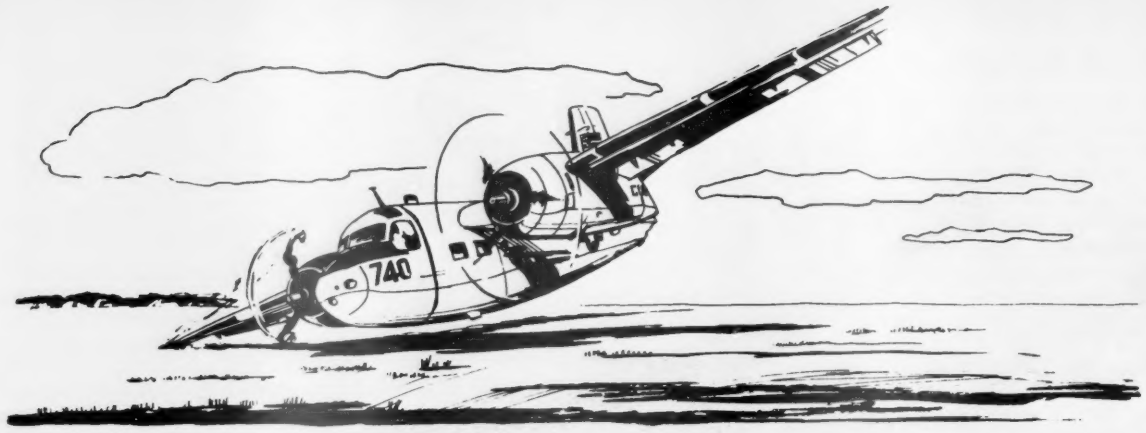
"Hard Headed"

FPO, San Francisco – (Re "Hard Headed," APR '79 APPROACH.) In our secondary mission of logistics/plane guard, we have encountered reluctance and even refusal by passengers to wear proper safety equipment. Our type commander has made it sufficiently clear, no safety gear – no flight. It is indeed a sad state of affairs when enough people care so little about their own lives, or of those around them, that a Three Star must dictate normal prudence.

If you ever fly with us, I'll apologize in advance for the boring brief, the uncomfortable cranial helmet, and hot flotation gear you'll have to wear.

CDR Bob Wildman
XO HS-4

● It's good to know there are some firm policies on this matter. I hope all the JO HACs remember that a Three Star made this policy the next time some "slightly heavy" argues about something in this regard.



Engine failure on takeoff

TWO pilots, a plane captain, and three passengers boarded a COD aircraft for a flight to USS BIRDFARM, steaming out at sea. In fact, the carrier was so far away, it was necessary for the C-1 pilots to fly to another base, refuel, and then head for the ship.

The aircraft had some discrepancies such as an inoperative main inverter, a fuel quantity gage error, an inoperative pilot's VGI, and the rudder trim indicator wired backwards. Lest a casual reader misinterpret these gripes as "downing," rest assured they were not. These discrepancies had occurred after the COD departed the ship some days before. They would be fixed when the aircraft returned to the ship.

The first leg to the staging base was routine. While the aircraft was being refueled, the crew and passengers stretched their legs and refueled also. Preflight inspection, before departure to the ship, revealed no *new* discrepancies. Checklists were completed; the tower cleared the COD to taxi to the duty runway and take off.

A rolling takeoff was made, and full power was obtained after about 500 feet of roll. Weather was no problem, and the wind was only 4 knots from 270 relative. The aircraft commander rotated the COD at 90 knots, and they were airborne about 2500 feet down the runway. A normal climb was begun, with their heading right down the middle of the runway.

Suddenly, in less than 10 seconds, a violent yaw to the right was experienced. The starboard engine had instantly and completely failed. Rudder assist was on, and the pilot floored the left rudder trying to hold heading. The copilot pulled up the gear, and the pilot reacted properly by reducing power on the port engine, to reduce torque. Wing flaps had been set at one-third and were left there during the emergency.

The aircraft drifted to the right, off runway heading, and toward a stack of 55-gallon drums. The COD's altitude was about 30 feet. The aircraft commander added power to avoid the obstruction. With the nose of the COD raised, the right wing was still down; power was reduced again. Immediately after this (4500 feet from the start of takeoff and 400 feet from runway centerline), the starboard wing and prop hit the ground.

The aircraft began a clockwise rotation around its vertical axis, in a tail-high attitude. The port prop contacted the mat, as the C-1 missed the array of drums, and the tail dropped. The aircraft then began sliding backward, and the trailing edge of the starboard wing hit the GCA trailer. The wing was torn off, and the force of the collision knocked the trailer off its chassis. The aircraft came to rest upright, 5200 feet from its starting point, 450 feet right of centerline, 210 degrees from the runway heading.

A fire had begun before the slide across the mat, and was intensifying. The pilot and copilot went out the pilot's overhead hatch. The plane captain and passengers tried to exit through the port entrance door, but they couldn't open it. It was blocked by sand and debris. They were then led forward by the plane captain and went out through the pilot's overhead hatch. Within 2 minutes, the crash trucks arrived and completely extinguished the fire.

The pilots' actions during the emergency were not questioned. They were between a rock and a hard place, and couldn't fly it out. Their ability to avoid the drums, filled with sand, and stacked three high, probably saved many lives. It later came to light that one or two of the passengers weren't strapped in. Cabin attendants must ensure that passengers are properly strapped in before reporting to the pilots that they are ready to take off. This time they were lucky. ◄

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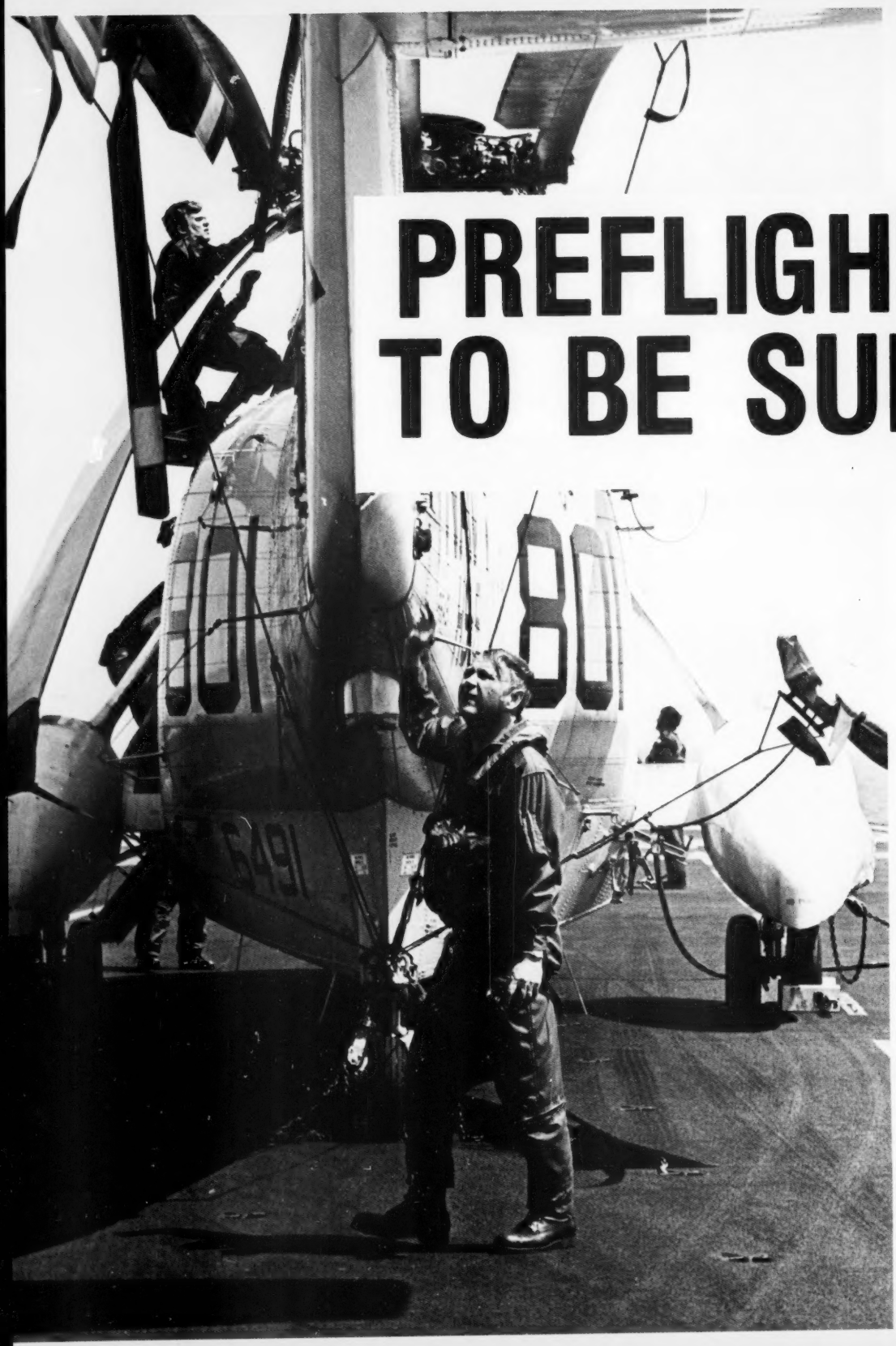
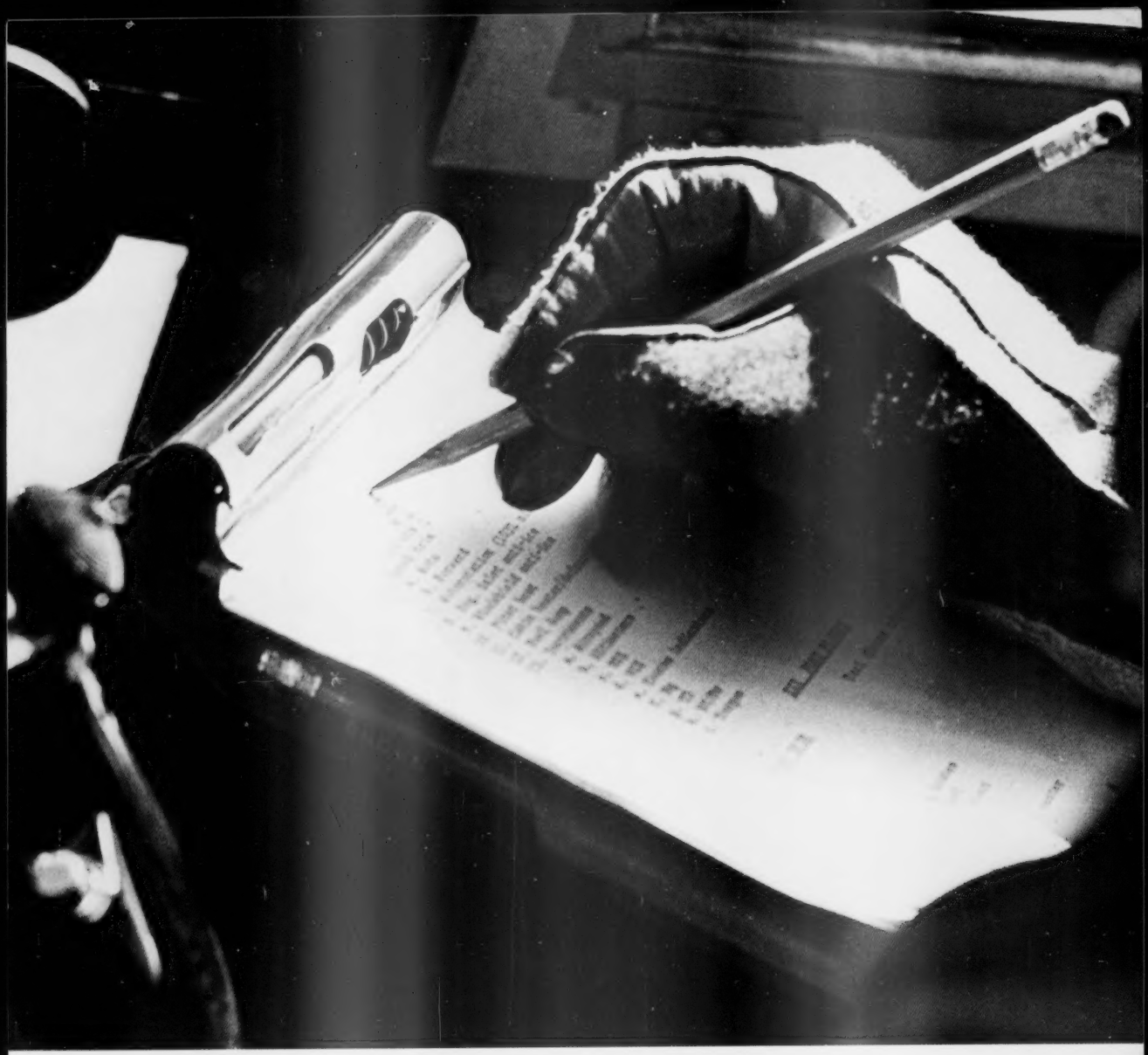

PREFLIGHT
TO BE SURE



PERFORM A DEATH-DEFYING ACT, USE YOUR CHECKLIST.